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ABSTRACT

Education has entered an era that will challenge our ability to adapt and to interact with new technological and interactive media. Elementary, secondary, and postsecondary education will all benefit from new technologies if educators respond to the profound possibilities of such technologies. Television is one media source that can be used effectively if its limitations are recognized and if it is used in conjunction with other media. Traditional teaching by television (i.e., the face-to-face lecture) must be supplemented by effective two-way television interaction. Supporting materials must complement the programs effectively, and the faculty's importance cannot be dismissed. Instructors must learn to serve as the managers of instruction. Colleges of education must adapt so that they can prepare educators for their new roles. It must also be recognized that if educators do not adapt, business and industry will take the lead in technological innovation, because the power of television has already been acknowledged. (Contains 36 references.) (SLD)

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TECHNOLOGY AND THE FUTURE OF EDUCATION

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TECHNOLOGY AND THE FUTURE OF EDUCATION

Introduction:

What role will technology play in the future of education? Imagine for a moment what unlimited possibilities lie ahead for education with the application of virtual reality.

> Virtual reality can best be described as a realistic three-dimensional computer generated graphical image(s) which allow interactive contact between the computer and the user as if it were real. It is a full color, full motion illusion of an environment manufactured by a powerful computer and displayed inside a pair of modified goggles with the use of sensor-equipped gloves or body suit. The VR goggles and gloves are equipped with electromagnetic sensors that track changes in position and orientation.[1]

Expanding Role of Technology:

The expanding role of technology offers enormous potential for the future of education. At the present time, our educational system has not fully utilized the vast resources available for educational programming. With the increasing cost of tuition and monies available to keep the doors of higher education accessible to the general public, innovative technologies will have a tremendous impact on education.

These new technologies will change our entire way of life. Colleges and universities will be faced with a tremendous task of educating vast segments of society, whose skills have become obsolete, to cope with an expanding information processing society. As the century comes to an end, our educational system--as we now know it--will be forced to keep abreast. The schools must be

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prepared to meet the challenges that face educators, students, and the general public. Consider the impact virtual reality will have on our mode of teaching:

1. Instead of requiring students to learn symbols in a textbook, virtual reality will let people experience mathematical equations. Students will act as a variable in an equation and watch forms, colors, or curves shift around them in response to changes in the variable's value.[2]

2. In virtuality reality, students can create an environment when dinosaurs existed. The student has the power to change the reality itself. The child can not only sit on the ground and watch the dinosaur thump past, to see how big a Tyrannosaurus Rex would be, but can actually become a Tyrannosaurus, and move around experiencing the body of a Tyrannosaurus Rex, looking down at the forest from such a height.[3]

3. In Japan, 'virtual buildings have enabled architects to manipulate design features, such as height, depth, and color, without using physical models to show their clients.

4. NASA uses VR to explore inaccessible reaches of space by transforming two dimensional reconnaissance photography into 3-D landscapes.[4]

The effective use of hardware and software technologies must be explored and expanded so schools can provide better service to the community of learners. Implementing these new technologies will involve a concentrated effort from faculty, administration, and support staff within a school system. The implementation of a system such as virtual reality is presently cost-prohibitive. However, other technological mediums which embrace the concept of computers and television are within our reach. These technological innovations will require school personnel to modify and to revise their views of education and instruction.

Adapting to Technological Changes:

What gains have educators made since the inception of technological wizardry? Our students view technology as a dimensional world of electronic wizardry--bleeping, whizzing sounds, visual displays, graphic illustrations, and fast-moving intangible images. For many educators, this world requires much adaptation.

> The stark realization of it all may have occurred one evening when you decided to review the material covered that day only to realize there was no paper (printed material) to hold, touch, see, and meditate on--the information was possibly gone forever (a telecast presented earlier that day) or was stored on a hard drive that was not readily available at one's finger-tips.

Educators have entered a fascinating era in education where They can make significant changes and modify the direction the educational material imparted will take in this information explosion. Education has entered an age that will challenge our ability to adapt and to interact with this fascinating overwhelming technological-interactive medium. The Fort Worth school district is attempting to become pioneers in this new age of "applied learning."

> Eighth-grade algebra students at two middle schools are working with a local title company on a yearlong mock purchase and renovation of a local park that will require youngsters to contract with an architect and perform a title search. Other classes, guided by personnel from General Dynamics, will engage in the mock selection of a supplier for an F-16 antenna, using computers to sift through eight bids. They will present their findings to executives of the corporation.[5]

A symptom called "technostress"--fear of computers--became a common word for educators in the early to mid 70s. The next

century will usher in the age of "adaptostress"--we will have the knowledge to perform but we will be required to perform "live" to larger off-site audiences and "real world" audiences.

> As America developed docudramas, simulations, artificial intelligence, MTV, wordprocessing, biofeedback, opinion polling, holograms, adventure games, news networks, databases, electronic bulletin boards, and other theaters of the mind, its educators performed Chautauqua, oratory, recitation, and vaudeville to diminishing applause.[6]

Accessing Education in Off-Site Locations:

Postsecondary education will become a major beneficiary of this modern technology. The use of computers to aid instruction has developed in the past decades thus permitting students in different locations to gain access to a single computer installation for a particular, programmed course of instruction. Despite high costs, computer-aided instruction has expanded into new areas and subjects.

For example, computers are being used nationwide to provide bibliographic searches. This use permits speedy access to subject materials without physically examining the references in a library. Pac Bell officials envision someday every student in the state of California connecting to vast resources by hooking up with electronic databases worldwide without even leaving the classroom (Los Angeles Times, August 5, 1992). No longer will teachers be given the excuse, "The sources I needed were checked out...the library materials were vandalized...the library no longer subscribes to that publication....inter-library loan takes too long, etc."

Understanding the Implications of Technology:

Educators will need to understand the future of education in a technological environment and respond quickly to the impact it will have on the teaching of subject matter in various disciplines. We can begin by asking questions such as: What **has** taken place? What **is** being done in this area? What predictions **have been** made for the future? **Do** I need any special training?

Television is one area which can be a valuable tool for setting the stage for future educational accomplishments in teaching writing principles, resume preparation, and presentation skills. Closed circuit television can be used to teach the techniques of interviewing by conducting mock student interviews. Television can be used to conduct interviews with human resource managers and impart their views on required entry-level job skills. Television has made an enormous influence on our lives. Some view television as being a positive force--a media that can be used to effectively train vast segments of our society with ease and efficiency. Others view television as a passive form of entertainment which should not be used as a major tool in education. These two viewpoints are both worthy of further attention.

Television: Friend or Foe?

As with any concept, there are advantages and disadvantages in using television as a media source. However, I want to emphasize that television is not intended to be used independently of other mediums. Television is intended to be used in conjunction with

other mediums such as the printed medium. The wheel has already been invented, and all we need to do is to add a little polish.

Producing Educational Programs:

In the 90s schools are facing some of the most severe cutbacks since the Great Depression because no monies are available to educate those who apply for admission, bodies are being turned away because the schools do not have adequate monies for the services needed. Today the cost of a college-produced telecourse is difficult to ascertain for a variety of reasons. One must first determine what amount of money is budgeted for a telecourse and/or telecourses. Then a number of factors need to be decided such as: the audience which would attract the greatest number of students, location site, presenter(s), software package(s), salaries of teachers, administrators, specialists, and support materials.

However, today the cost of **not** implementing college-produced telecourses will lead to a further decline in the quality of education. For example, in California the state is facing the biggest crisis in its history because:

> If the Legislature does not approve the student fee increase, provide more General Fund revenue, the citizens, staff and faculty alike will witness a rapid decline in the quality of education from which we may never recover. While we continue to explore ways to economize, we are not cutting fat, but rather muscle and bone. Lack of adequate, minimal funding next year will result in layoffs of permanent faculty and staff, denial of admission to qualified students, program cuts, and a drastic reduction in the number of classes offered (Highsmith, 1992).

Many schools found it more beneficial to buy tested software packages. The initial cost outlay for high quality multi-media

software packages such as "Columbus"-- about the life and times of the Italian explorer, developed by IBM cost more than $5 million to develop and may cost as much as $10,000 per system. (Zigerell, 1979).

Today one of the most promising new projects in existence is the Annenburg Project. California's CSU statewide Project DELTA (Distance Education Learning Teaching Alternative) promises to have a tremendous impact on education via distance learning. PBS (Public Broadcasting System) is one of the best known sources for providing television course materials for adult students.

Educating the Viewing Audience:

The viewing audience of today wants to be entertained while being educated. Unfortunately, many traditional classrooms are still delivering the same boring monologue and lackluster lectures to a diminishing audience. However, teachers possess the necessary skills and knowledge to lead learners into this new frontier. We must become the "models" for others and practice "live" what we have preached for so long. With the current technological advancements in multi-media, teachers have the opportunity to provide quality training using materials such as Microsoft's Power Point presentation software and QuickTime video software with a high level of sophistication.

Changing the Teaching/Learning Process:

People are realizing that education is a lifelong process and with that realization comes the desire to pursue further training in the comfort of their homes and workplaces.

> In isolated corners of the country, a handful of school systems, prodded by sagging test scores and prolonged criticism from the business community are attempting to drastically expand high-technology occupational courses and to teach virtually every academic subject in the context of the workplace.[7]

Students from all walks of life will use television as a tool to purchase products, to make investment decisions, and to acquire an education. As educators, we have to readjust our mode or delivery of instruction in order to serve the needs of diverse markets; we need to become more flexible in interacting with this wide array of individuals. Telecourses have come a long way since the days of "chalk and talk."

Of course, one of the most important components of educational television is the product itself. The method of delivery is crucial for the success of any program. The early years of telecourse delivery was the face-to-face lecture method--the "talking head" approach is still being used in the classroom today much to the chagrin of the learners.

> This method was extremely ineffective, because teachers were not trained to "perform." Thus, the face of the teacher began to disappear from TV courses. His or her face was taken by a host, who, in a course in 'Personnel Management' or 'Principles of Marketing' interviewed experts from the "real" world in a TV studio or on location (Zigerell, 1979).

As stated by Zigerell in 1979, the classroom in many schools hasn't changed much. The teacher-host has not disappeared, but now there is little desire by the learner for this type of delivery. The average attention span of the average viewing audience is between five and fifteen minutes, therefore, this type of delivery does not effectuate learning to any great degree. For such a

program to be successful, an effective two-way interactive process must be formulated and utilized.

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Teachers are fully aware of the importance of establishing rapport with an audience to gain trust, credibility, and integrity.

Developing Effective Telecommunication Materials:

Television has the great capacity to take a viewer to places they could never visit in reality. The television program, **The Incredible Machine**, takes the camera inside the human body and examines the functions of various organs. Imagine being enrolled in a biology class, and the teacher mentions that the class will discuss the role corpuscles play in fighting disease.

First, the **word** corpuscle may have very little meaning for most students because the word is so abstract. How does one see, touch, and relate to word **corpuscle**? Next, the students are given a definition to accompany this word and possibly a drawing of a corpuscle. NOW, all the students should be familiar with this term and should be able to grasp this concept in order to pass a test.

WRONG, WRONG, WRONG!!!! MAYBE, but chances are the students do **not** really understand this concept. Yet, if these students are given the opportunity to view a well-produced program such as **The Incredible Machine** learning will take place. Those abstract terms become concrete terms because the students **experienced** learning; they became active participants instead of passive viewers or listeners.

> Programs such as the **Ascent of Man** and **The Adams Chronicles** have now been used by scores of educational institutions for credit courses in the teaching of science and American history. These courses were so well received, not only by those students who viewed them for credit, but they appealed to the general audience as

well. The success of these is apparent when a large percentage of the viewing audience watched every single episode (Carnegie Commission, 1979).

The same learning approaches can be applied to the writing process. Successful projects undertaken by professors at California State University, Los Angeles state that:

> Multi-media E-mail allows the transmission of information across an existing world-wide network. Multi-media E-mail consists of formatted text, graphics, voice, sound, music, executable applications, documents, (wordprocessing files, spreadsheets, database files, etc.) and folders containing any mix of file types.
>
> Students can receive and interact with this kind of electronic lesson at any remote location connected to the Internet. Learning can take place at the student's own pace, in the student's own time. Students can interact with the instructor and collaborate in a personal and non-threatening way with other students using e-mail (Novak, 1993).

Research indicated that students do equally well in both traditional courses and telecourses. A major reason for this is the availability of excellent textbooks and/or well developed supporting materials. Students indicated that a major benefit of the telecourse program that contributed to their success was supporting materials.

Selecting Faculty:

What the faculty's role in a telecourse? The role of the faculty member involved in telecourse management is a vital role. One major characteristic of a faculty member's role in a telecourse is serving as a "manager of instruction." No longer can an instructor enter a classroom, close the door, and perform for a few students. This role will not be suitable for all teachers. Selecting teachers who possess the traits and abilities necessary

to make an excellent television teacher will not be an easy one. Faculty members have been reluctant to adapt to this new method of instruction. U.S. News (January 1993) stated, "the prevailing academic culture both fears and misunderstands any technology that does not place the teacher at the center of the educational process."

The utilization of television as an effective tool will not be forthcoming until we give our best teachers the time and resources that go with effective teaching. However, studies indicate that approximately two-thirds of our nation's teachers, have at some point in their instruction, used television in some form.

Preparing Education/Media Specialists:

What must education do in order to effectively prepare educators for their new roles? Colleges of education do not adequately prepare teachers to function in the role of media specialist. Teachers are not aware of the desirable traits and abilities required to become an effective telecourse instructor. The list of requirements are:

1. A thorough knowledge of the subject matter
2. Effective classroom teaching techniques
3. Strong communication skills
4. Creative abilities
5. Well-organized work habits
6. Interpersonal skills
7. Ability to handle constructive criticism
8. A sense of humor
9. Improvisation abilities

As mass media instructors/managers, teachers will gain a vast array of knowledge that expands beyond the classroom. Research studies indicated that those teachers who are able to develop

effective software packages will be earning salaries comparable to that of movie stars. There is a large untapped market waiting to be created and developed through the use of effective learning packets. One must be willing to spend the time necessary in the development and implementation of software packages and tele-courses.

Preparing Course Materials:

Teachers who teach via interactive television (one-way or two-way interactive systems) state that the initial course preparation takes time. Course materials for the off-site are often Federal expressed to off-site locations overnight for the next day's session. Some teachers make use of the electronic chalkboard to transmit information. Some teachers prepare all their course materials and distribute them **before** the course begins. Whichever method is used, the preparation will still take time, talent, and money.

Meeting Technological Challenges:

What does the future hold for you as a "manager of instruction"? Those educators who can look to the future have a bright, challenging career in education. These technological advances will expand our educational markets. The demand for bright, energetic teachers who can communicate effectively will create opportunities for those who can look beyond the modes of traditional learning.

Quality education will be available and accessible for all those who desire it. Students will be exposed to new methods of instruction at a time convenient to them and in a location of their choice.

Competing with Private Enterprise:

If educators do not take their place in this technological world of instruction, then business and industry will take the lead in this area. The power of telecommunications as an educational delivery system has already been noticed by those outside our traditional educational institutions.

> Tele-Learning Network, the world's first electronic university, claims that it will educate more people than any other private educational institution in the world. AT&T spends $1.7 billion a year on education and training. Some firms like General Electric have started to sell their graduate-level engineering programs to other firms (Tate, 1983).

In 1992 Yale President Benno C. Schmidt resigned from the University to create a system of high-tech private schools across the nation. Support from business and industry will be vital to the success of high-tech programs. Studies indicate that an upgrading of employees' technical skills is needed every three years. Business can be an asset in informing schools of employees training needs, equipment changes, etc. Education often teaches skills on outdated equipment and the cooperation of business-/industry and education could work together to update equipment and allocate resources needed for training.

Conclusion:

Teachers who claim they are trying to protect their territories by the avoidance of televised instruction are actually creating the problem they have for so long dreaded--becoming obsolete. Gabriel Ofiesh made following prophetic statement at the American Association of Junior Colleges Program (1969):

> The time is soon coming when any school system which does not have individualized instruction using electronic media will die on the vine. Junior colleges should be completely committed to individualized learning. The new colleges should have 30 percent of their students off-campus.

That time is here, that time is now! This age of telecommunications is upon us. All of the information I have reported documents the future trends in educational television. The major issues concerning production costs, students as long-distance learners, faculty roles and attitudes, and availability and creation of programming materials were my primary targets. Through the effective use of telecommunications, colleges can increase enrollments, provide quality education, improve instruction, and offer cost alternatives to education which will ultimately benefit all segments of society.

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